

**THE DIATOM TYPES OF EMILE MANGUIN.
II. VALIDATING DESCRIPTIONS
AND DESIGNATION OF TYPES
FOR THE NEW CALEDONIA SPECIES.**

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ABSTRACT — The 61 taxa described as new by Emile Manguin in his 1962 paper on diatoms from New Caledonia lacked Latin descriptions and type designations; they are therefore invalid according to the International Code of Botanical Nomenclature. We provide Latin descriptions for Manguin's taxa and, based on his original designations on his slides, identify holotypes. Holotypes for several species were not indicated by Manguin, and we have therefore designated holotypes from Manguin's slides. Specimens of nine taxa could not be found, and Manguin's illustrations are designated as holotypes for three of them where original material has been lost. The remaining six taxa could not be located in the extant Manguin material, and they have been left undesignated. English translations of the original French descriptions are also provided.

RÉSUMÉ — Dans son article de 1962 sur les diatomées de Nouvelle Calédonie, Emile Manguin a décrit 61 nouveaux taxons, mais sans accompagner ses descriptions de diagnoses latines et sans désigner de types; ils sont donc invalides selon le code international de nomenclature botanique. Nous fournissons une diagnose latine pour chacun des taxons de Manguin et, sur la base de ses désignations originales de ses lames, nous avons identifié les holotypes. Pour plusieurs espèces, les holotypes n'ont pas été indiqués par Manguin et nous les avons donc désignés dans ses lames. Des spécimens de 9 taxons n'ont pas pu être trouvés et, pour 3 d'entre eux dont le matériel a été perdu, les illustrations originales de Manguin ont été désignées comme holotype. Les 6 taxons restant n'ont pu être retrouvés dans le matériel existant et ont été laissés sans description. Des traductions en anglais des descriptions originales en français ont aussi été fournies.

KEY WORDS: Bacillariophyceae, diatom, taxonomy, nomenclature, type, New Caledonia, Manguin.

INTRODUCTION

Manguin identified a total of 61 new taxa in his material from New Caledonia (Manguin 1962), yet he did not provide Latin descriptions nor did he designate types

for his new taxa. Due to these deficiencies in compliance with Articles 32.1, 36 and 37 of the International Code of Botanical Nomenclature (Greuter *et al.* 1994), Manguin's taxa are considered invalid. In this paper designations of types and Latin descriptions are provided to validate Manguin's taxa. Of the 19 samples examined by Manguin to produce his treatise (pp. 2, 3), slides (without material) were found at the Laboratoire de Cryptogamie, Muséum National d'Histoire Naturelle, Paris (PC), representing 17 samples. In Table 1 are listed the station numbers as indicated by Manguin and the slide numbers in PC. Written on the slides, in Manguin's hand, there are designations for 37 of the 61 new taxa. In addition, 15 of the new taxa not designated on the slides by Manguin have been identified and we have designated holotype slides for these taxa. Cases where holotypes have been chosen by us are designated by an asterisk. A total of nine taxa could not be identified in the Manguin material. Three of these taxa, *Melosira neocaledonica*, *M. solitaria* and *Stauroneis neocaledonica*, have Manguin's original illustrations designated as holotypes (as provided for in Article 8.3 of the ICBN), since they were identified from material that has subsequently been lost (sample 14 of Manguin). The six remaining taxa for which specimens could not be found in the original Manguin material, including *Achnanthes pseudolanceolata*, *Cymbella maillardii*, *Didymosphenia geminata* (Lyngbye) M. Schmidt in Schmidt *et al.* var. *neocaledonica*, *Navicula contentaeformis*, *N. pseudotenera*, and *N. subrhynchocephala* Husted f. *robusta*, have not been described in this work. In addition, several of Manguin's epithets would have been later homonyms at the time they presented in the 1962 publication. For these taxa, we have presented new names. All type specimens are deposited at PC.

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1. Creek Crevecreur; AD7648, AD7664, AD7665, AD7681, AD7682.
 2. Néhouée AD7666, AD7667
 3. Koniambo, rocher suintant; AD7654, AD7655, AD7656, AD7657
 4. Koniambo, exp. mousse; AD7639, AD7640, AD7658, AD7659, AD7660, AD7661, AD7662
 5. Anse Vata; AD7651.
 6. Anse Vata, Lemna; No slides exist
 7. Pain de Sucre; AD7668.
 8. Sanatorium; AD7641, AD7642, AD7643.
 9. Plaine des Lacs; AD7649, AD7650.
 10. Haute Hienghène, Mousses exp.; AD7632, AD7633, AD7634, AD 7635.
 11. Haute Hienghène, *Eichhornia*; AD7672, AD7673, AD7674, AD7675
 12. Col des Roussettes; AD7636, AD 7637, AD7638.
 13. Ile Hugon; AD7644, AD7645, AD7663.
 14. Mè Améri, mer; No slides exist
 15. Mè Améri, Palmiers; AD7679, AD7680
 16. Bourail, expr. d'*Eichhornia*; AD7646.
 17. Haute Ouinné; AD7647
 18. Col de Plum; AD7669, AD7670, AD7671.
 19. Haute vallée, creek Pernod; AD7676, AD7677, AD7678
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Table 1. Station Number, station description and PC Diatom Collection slide numbers for Manguin slides used in 1962 publication.

Pagination under each taxon name indicates the page in Manguin (1962) where his description appears. The sample numbers in which Manguin reported the

species to occur are also listed after each taxon. We also provide translations of Manguin's descriptions into English and offer comments on the nomenclature of the taxa.

Recently, Moser *et al.* (1995) have treated the freshwater diatoms from New Caledonia, based primarily on the collections of Maillard. In their treatment, several species of Manguin are considered. Moser *et al.* recognized that Manguin's species were not validly published, and in some cases designated neotypes, although they did not validate the species with Latin descriptions. Since original material for these species is extant, and validation of Manguin's taxa was not accomplished by Moser *et al.* (1995), names in their work are superfluous.

NEW TAXA, DESCRIPTIONS AND TYPE DESIGNATIONS

Melosira guillauminii Manguin *ex* Kociolek & Reviere

Page 13, pl. 1, fig. 1a-f

Sample: 9

Holotype: AD7649

Descriptio: Cellulae conjunctae in catenis individuorum 2-3, sed saepissime sejunctae, praesertim post tractationem materiae lectae. Diameter 9-12 μm . Axis pervalvaris dimidii cellulae vegetativae 4.5 μm altus, dividens usque ad 8.5 μm . Limbus valvae pariete crasso punctis paucis sparsis ornato. Pleurae variables secundum numerum divisionum successivarum. Pseudosulcus dilute visibilis; sulcus margo faucesque absunt. Discus valvaris punctis paucis ornatus, area centrali hyalina irregulariter delineata et trientem diametri disci occupante.

Description: Cells united in chains of 2-3 individuals, but more often in an isolated state, especially after treatment of the harvested material for usual fixation. Diameter 9-12 μm , height of the pervalvar axis of a half cell in the vegetative state 4.5 μm , up to 8.5 μm when a cell is dividing. Valve mantle wall thickened, ornamented with a few sparse puncta, connective bands variable according to the number of successive divisions. Pseudosulcus slightly apparent, sulcus edge and gorge absent. Valve disk has few puncta with a hyaline central zone occupying a third of the diameter of the disk and irregularly delimited.

Melosira neocaledonica Manguin *ex* Kociolek & Reviere

Page 13, pl. 1, fig. 3

Sample: 14

Holotype: Pl. 1, fig. 3

Descriptio: Cellulae in catenis individuorum 2-3 conjunctae, cylindricae, convexae ad remitates, diametro 9 μm ; axis pervalvaris dimidii cellulae 5-6 μm altus. Limbus valvaris numero variabili pleurarum undulatarum; pseudosulcus profundus marginem versus accrescens. Sulcus et margo undulata sine fauce manifesta. Disci valvares vicini conjuncti per spinas lamellosas ad marginem locatus.

Description: Cells united in chains of 2-3 individuals, cylindrical, convex at their extremities, diameter 9 μm , height of the pervalvar axis of a half-cell 5-6 μm . Valve

mantle with a variable number of undulate connective bands, pseudosulcus deep large towards the margin, sulcus and edge undulate, without apparent gorge. Neighboring valve disk walls united by the lamellose spines situated along their margins.

Melosira solitaria Manguin ex Kociolek & Reviere

Page 13, pl. 1, fig. 2a, b

Sample: 14

Holotype: Pl. 1, fig. 2a, b

Descriptio: *Cellulae solum solitariae visae, cylindricae et maxime convexae ad extremitates, diametro 7.5-8 µm; axis pervalvaris dimidit cellulae 6 µm altus. Valvae hemisphaericae obtegentes limbo pleuris numerosis instructo. Sulcus parum constrictus; margo aliquantum manifesta. Discus valvaris spinis minutis in area centrali; in centro membrana canalibus tenuissimis trans crassitudinem perforata.*

Description: Cells observed solely in the isolated state, cylindrical and highly arched at their extremities, diameter 7.5-8 µm, height of the pervalvar axis of a semi-cell 6 µm, valves hemispherical covered by a mantle with numerous connective bands, sulcus slightly constricted and edge quite apparent. Valve disk supplied with small spines situated on the central zone, membrane is crossed in height and in the middle of the disk by very fine canals.

Cyclotella iridioides Manguin ex Kociolek & Reviere

Page 14, pl. 1, fig. 5

Sample: 1

Holotype: AD7665

Descriptio: *Valvae ovaes-ellipticae. Longitudo axium 15 X 11.5 µm. Area marginalis, in latere interno, linea umbrosa manifestissima marginata. Area centralis elliptica irregularis, latitudine triente axis parvi valvae, subtiliter reticulata et punctulata. Striae costas robustas formantes, circa 12 in 10 µm, ad coronam umbrosam leviter amplificatae, et ibi omnes spinam parvam satis manifestam ferentes.*

Description: Valves oval-elliptical, length of the axes 15 µm by 11.5 µm. Marginal zone circumscribed on the interior margin by a quite apparent shadow line. Central zone irregularly elliptical, about a 1/3 of the length of the smaller valve axis, travelling from a finely meshed reticulate network strewn with small puncta. Striae in the form of robust ribs, about 12 in 10 µm, slightly enlarged up to the level of the shadow crown, present at each one at this same level a small spine is apparent.

Cyclotella neocaledonica Manguin ex Kociolek & Reviere

Page 14, pl. 1, fig. 7a-c

Samples: 2, 14, 16

Holotype: *AD7646

Descriptio: *Frustula manifeste cuneiformia in aspectu cingulari. Valvae heteropolares, latere ventrali recto, latere dorsali convexo, leniter attenuatae polum angustiore versus.*

polo altero late rotundato. Longitudo valvarum 17-28 µm, latitudo maxima 3.5-4 µm. Striae 16 in 10 µm, densiores et obliquae circum nodulos terminales.

Description: Frustules clearly cuneiform in girdle view. Valves heteropolar rectilinear on the ventral margin, convex on the dorsal margin and imperceptibly attenuate in the direction of the more straight poles, opposite this is largely rounded, length 17-28 µm, maximum breadth 3.5-4 µm. 16 striae in 10 µm, more condensed and with an oblique direction around the terminal nodules.

Comment: Moser *et al.* (1995) designated a neotype (PC, Collection Maillard No. 18/1, Source de ruisseau du Mont Dogny) for this taxon, but did not provide a validating description.

***Eunotia fallax* Cleve var. *bacillum* Manguin ex Kociolek & Reviere**

Page 15, pl. 1, fig. 8

Sample: 9

Holotype: AD7649

Descriptio: Valvae arcuatae, lateribus parallelis usque ad extremitates, polis late rotundatis. Longitudo valvarum 28-29.5 µm, latitudo 1.5-2 µm. Striae 9-10 in 10 µm.

Description: Valves arched with parallel margins until the extremities, poles largely rounded, length 28-29.5 µm, breadth 1.5-2 µm, 9-10 striae in 10 µm.

Comment: The slide label indicates "*Eunotia exigua* var. *bacillum*".

***Eunotia fallax* Cleve var. *vermicularis* Manguin ex Kociolek & Reviere**

Page 15, pl. 1, fig. 9

Sample: 9

Holotype: AD7649

Descriptio: Valvae latere ventrali leniter concavo, latere dorsali convexo, paulo contractae et plus minusve longe prolongatae ad extremitates, polis rotundatis, 15.5 µm longae, 2.5 µm latae; striae 8-9 in 10 µm, inter se dissitiores illis varietatis superioris.

Description: Valves weakly concave along the ventral margin, convex along the dorsal, slightly constricted and extended at the extremities, poles rounded. Length 15.5 µm, breadth 2.5 µm, striae even more distant than in var. *bacillum*, 8-9 in 10 µm.

Comment: Slide label indicates "*Eunotia exigua* var. *vermicularis*".

***Eunotia monodon* Ehrenberg var. *neocaledonica* Manguin ex Kociolek & Reviere**

Page 15, pl. 1, fig. 10a, b

Samples: 6, 7

Holotype: AD7651

Descriptio: Valvae latere ventrali recto in area mediana concavo extremitates versus, latere dorsali convexo, plus minusve longe attenuatae prope polos, 58-78 µm longae, 9-10 µm latae. Striae 6-9 in 10 µm in area mediana, 12-13 in 10 µm prope polos. Sine pseudoraphe parallela secus marginem ventralem.

Description: Valves with ventral margin straight on the median part and becoming

concave towards the extremities, dorsal margin convex, + longly attenuate near the poles, length 58-78 μm , breadth 9-10 μm , median striae 6-9 in 10 μm , 12-13 in 10 μm near the poles. No parallel pseudoraphe all along the length of the ventral margin.

Comment: Manguin indicated the presence of this species on a slide from sample 5, although it was listed from samples 6 and 7.

***Eunotia spiculaeformis* Kociolek & Reviere**

(*E. pseudolunaris* Manguin nom. nud.)

Page 15, pl. 1, fig. 12

Sample: 16

Holotype: AD7666

Descriptio: *Valvae leniter arcuatae, lateribus parallelis in area mediana, leviter attenuatae prope extremitates, polis rotundatis plus minusve obtusis et paulo contractis prope nodulos terminales qui polis manifeste distantes sunt. Raphe aliquantum prolongata parallele ad axem apicalem ut in Eunotia flexuosa (Bréb.) Kütz. Longitudo valvarum 61 μm , latitudo 4 μm . Striae punctulosae, 11-13 in 10 μm , 16 in 10 μm ad extremitates.*

Description: Valves weakly arched with parallel margin on the median part, imperceptibly attenuate towards the extremities, rounded poles + obtuse and slightly constricted at the level of the terminal nodules, the latter visibly receding at the poles. Raphe slightly extends parallel to the apical axis, as in *E. flexuosa* (Bréb.) Kütz., length 61 μm , breadth 4 μm , 11-13 striae in 10 μm , finely punctate, 10-16 in 10 μm at the extremities.

Comments: Use of the original epithet of Manguin (*E. pseudolunaris*) would make this name a later homonym of a species described by Venkataraman (1939). Although Van Landingham (1969, p. 1553, 1558) offered a new name, *E. neocaledonica* Van Landingham, for Manguin's species, neither name has nomenclatural status. This species was reported from sample 16, but our holotype is from sample 2.

***Achnanthes neocaledonica* Manguin ex Kociolek & Reviere**

Page 16, pl. 1, fig. 14a, b

Samples: 15, 16

Holotype: *AD7647

Descriptio: *Valvae longae lineares-lanceolatae, valde constrictae-capitatae ad extremitates, polis late rotundatis, 47-57 μm longae, 4-5 μm latae. Araphovalva pseudoraphe lineari perangusta, parum amplificata prope medium, striis radialibus in medio, perpendicularibus extremitates versus, 20-22 in 10 μm , striis 2 vel 3 centralibus aliis robustioribus. Raphovalva raphe recta valde manifesta, area axiali recta satis ampla, angustata ad constrictionem terminalem, ad polos ampliata instar areae parvae polaris; area centrali instar fasciae amplae rectangularis latera valvae attingenti; striis omnibus radialibus numero illas valvae oppositae aequantibus.*

Description: Valves linear-lanceolate, strongly constricted-capitate at the extremities, broadly rounded at poles, length 47-57 μm , breadth 4-5 μm . Valves without raphe have a linear pseudoraphe very narrow slightly enlarged towards the middle; median striae radial becoming perpendicular towards the extremities, 20-22 in 10 μm the 2-3 central

striae more robust than the next. Valve with raphe has straight raphe that is quite apparent, axial area straight and relatively large, then becomes narrow contracted going to the valve terminus; enlarges noticeably at the poles in a small polar area. Central area a large rectangular band reaching the border of the valve. Striae entirely radiate and of the same number as the opposite valve.

Comment: This holotype is from sample 17 although this species was reported from samples 15 and 16. Moser *et al.* (1995) designated a neotype (PC, Collection Maillard No. 38/3, Rivière des Lacs) for this taxon, but did not provide a validating description.

Diatomella parva Manguin *ex* Kociolek & Reviere

Page 16, pl. 2, fig. 1

Sample: 6

Holotype: *AD7668

Description: *Frustula solum in aspectu cingulari observata, itaque diagnosis hujus Diatomellae novae incompleta est. In hac positione cellula dimidia frustuli protuberationes duas noduliformes in medio perforatas praebet. Protuberationes pleuram contingunt et spacio aequantii circa trientem altitudinis axis apicalis separatae sunt. Longitudino 7.5 µm; striae circa 23 in 10 µm.*

Description: Frustules viewed only on the connective face, a consequence is the diagnosis of this new *Diatomella* is incomplete. The half cells of the frustule show in this position 2 nodule-like protuberances perforated in their central part, these half-cells are appressed on the wall of the intermediate bands and separate each other by a living space equal to about 1/3 of the height of the apical axis. Length 7.5 µm, about 23 striae in 10 µm.

Comment: Although reported by Manguin from sample 6 only, specimens in girdle view were observed from sample 7.

Mastogloia malayensis Hustedt var. *robusta* Manguin *ex* Kociolek & Reviere

Page 17, pl. 2, fig. 2; pl. 8, fig. 1

Sample: 18

Holotype: *AD7670

Description: *Valvae ellipticae-lanceolatae, attenuatae subrostratae ad extremitates, polis late rotundatis, 49-70 µm longae, 14-15 µm latae. Rami raphes valde undulati. Area axialis linearis angustata ad extremitates; area centralis late elliptica. Costae robustae radiales, 8-12 in 10 µm, lineis longitudinalibus sectae, circa 12-15 in 10 µm. Series partectarum leviter curvatae et satis remotae lateribus valvae; partectae rectangulares transversales, circa 6-7 in 10 µm.*

Description: Valves elliptical-lanceolate, attenuate subrostrate at the extremities, broadly rounded at the poles, length 49-70 µm, breadth 14-15 µm. Raphe branches strongly undulate. Linear axial area narrowed at the extremities; central area broadly elliptical. Ribs robust, radial, 8-12 in 10 µm, crossed by the longitudinal lines about 12-15 in 10 µm. Row of locula weakly curved and quite far from the border of the valve, locula rectangular, transverse about 6-7 in 10 µm.

Amphipleura guillauminii Manguin ex Kociolek & Reviere

Page 17, pl. 2, fig. 3a, b

Samples: 18, 19

Holotype: AD7669

Descriptio: *Valvae longae lineares, attenuatae-rostratae ad constrictae et subcapitatae ad extremitates, polis late rotundatis, 80-139 µm longae, 6-7.5 µm latae. Rumi raphes longitudine circa trientem axis transapicalis aequantes. Striae transapicales 26-30 in 10 µm, perpendiculares linea mediana, ad extremitates convergentes, lineis tenuibus longitudinalibus sectae.*

Description: Valves longly linear, attenuate-rostrate to constricted and subcapitate at the extremities, poles broadly rounded, length 80-139 µm, breadth 6-7.5 µm. Length of the raphe branches equal to about 1/3 of the apical axis of the cell; 26-30 transapical striae in 10 µm, perpendicular to the median line, convergent at the extremities, crossed by delicate longitudinal lines.

Comment: Moser *et al.* (1995) designated a neotype (PC, Collection Maillard No. 43/4, Lac en Huit) for this taxon, but did not provide a validating description.

Frustulia neocaledonica Manguin ex Kociolek & Reviere

Page 18, pl. 2, fig. 4a, b; pl. 8, fig. 4a-c

Samples: 18, 19

Holotype: AD7669

Descriptio: *Valvae rhomboideae-lanceolatae plus minusve protuberantes in parte mediana, rostratae ad constrictae-capitatae ad extremitates, 62-88 µm longae, 14-20 µm latae. Costa mediana robusta, aliquantum dilatata nodulum centralem versus, non constricta circum aream centralem cujus ambitus ellipticus ad subrhomboideus est. Noduli polares rima plus minusve manifesta. Striae transapicales omnes perpendiculares linea mediana, circa 26-30 in 10 µm, lineis tenuibus longitudinalibus sectae, circa 24-30 in 10 µm.*

Description: Valves rhomboid-lanceolate + bulging around the median part, rostrate to constricted-capitate at the extremities, length 62-88 µm, breadth 14-20 µm. Median rib robust, enlarged somewhat towards the central nodule, without constriction around the central area, the latter with an elliptical to subrhomboid contour, polar nodules with a slit + apparent. Transapical striae entirely perpendicular to the median line, about 26-30 in 10 µm, crossed by fine longitudinal lines, about 24-30 in 10 µm.

Comment: Moser *et al.* (1995) designated a neotype (PC, Collection Maillard No. 72/2, "Rivière Pernod") for this taxon, but did not provide a validating description.

Stauroneis neocaledonica Manguin ex Kociolek & Reviere

Page 18, pl. 3, fig. 1a, b

Sample: 14

Holotype: Plate 3, figure 1

Descriptio: *Frustula latissima in aspectu cingulari. Valvae longissimae et anguste lanceolatae, leviter tumidae in parte mediana, abrupte constrictae ad parietes polares, tum cuneiformes polis rotundatis obtusis, 53-88 µm longae, 5 µm latae. Raphe recta linea non*

concomitata. Area axialis angusta linearis; area centralis notabiliter amplificata latera valvae versus. Parietes polares crassissimi bicurvati lateribus oppositis ambobus concavis. Striae leviter radiales in area mediana valvae, tum linea mediana perpendiculares, circa 16-18 in 10 μm , punctis linearibus.

Description: Frustules very large in connective view. Valves very longly and narrowly lanceolate, slightly tumid around the median part, abruptly constricted at the level of the polar partitions, then cuneiform with poles rounded-obtuse, length 53-88 μm , breadth 5 μm . Raphe straight without accompanying line. Axial area narrow, linear; central area remarkably enlarged to the margin of the valve. Polar partitions very thick, doubly curved opposing anteriorly-posteriorly. Striae weakly radiate about the middle of the valve, then becoming perpendicular to the median line, a short dash, about 16-18 in 10 μm .

Comment: Moser et al. (1995) consider *S. neocaledonica* a synonym of *S. frauenfeldianum* (Grunow) Heiden.

***Navicula muscora* Kociolek & Reviere
(*N. bryophiloides* Manguin nom. nud.)**

Page 19, pl. 2, fig. 5

Sample: 7

Holotype: *AD7668

Descriptio: *Valvae ellipticae-lanceolatae, attenuatae subrostrataeque extremitates versus, 19.5 μm longae, 3.5 μm latae. Area axialis angusta, ad extremitates attenuata. Area centralis nonnihil manifesta, transverse irregulariter amplificata. Striae omnes radiales, in area mediana circa 23-26 in 10 μm , in area terminali plus quam 30 in 10 μm , circum aream centralem irregulariter abbreviatae.*

Description: Valves elliptical-lanceolate, tapered and subrostrate towards the extremities, length 19.5 μm , breadth 3.5 μm . Axial area narrow, constricted at the extremities, central area slightly distinguished, irregularly enlarged transversely. Striae entirely radial, about 23-26 in 10 μm around the median part, more than 30 in 10 μm at the terminal part, irregularly shortened around the central area.

Comment: Use of the original epithet of Manguin (*N. bryophiloides*) would make this name a later homonym of his own species, described in Bourrelly & Manguin (1954, p. 27, pl. 3, fig. 31.). The name indicates association of this species with bryophytes.

***Navicula corticola* Manguin ex Kociolek & Reviere**

Page 19, pl. 2, fig. 7a, b

Sample: 9

Holotype: AD7649

Descriptio: *Valvae ellipticae-lanceolatae, leviter constrictae subcapitataeque ad extremitates, polis rotundatis-obtusis, 13-16.5 μm longae, 3.5-4.5 μm latae. Raphe filiformis aliquantum curva prope poros centrales. Area axialis anguste lanceolata, aliquantum dilatata circum nodulum centralem. Striae subtiles, omnes radiales, in parte mediana 23-25 in 10 μm , prope extremitates minimum 30 in 10 μm ; striae medianae saepissime longitudine aequales, raro irregulariter abbreviatae.*

Description: Valves elliptical-lanceolate, slightly constricted and subcapitate at the extremities poles rounded-obtuse, length 13-16.5 μm , breadth 3.5-4.5 μm . Raphe filiform, a slight curve near the central pores. Axial area narrowly lanceolate, then slightly enlarged around the central nodule. Striae delicate, entirely radial, 23-25 in 10 μm around the median part, 30 and more in 10 μm at the extremities, more often the median striae are of equal length, rarely irregularly shortened.

Comment: Manguin lists this species also on slide AD7652, which is from sample 3. We have selected the slide from sample 9, the only sample indicated in his "Inventaire Systématique Général" where this species occurred.

Navicula eichhorniaephila Manguin ex Kociolek & Reviere

Page 19, pl. 2, fig. 8

Sample: 11

Holotype: AD7672

Descriptio: Valvae anguste lanceolatae, acutae productaeque ad extremitates, 35 μm longae, 5 μm latae. Raphe recta nonnihil manifesta. Area axialis asymmetrica, peranguste lanceolata, aliquantum dilatata circum nodulum centralem. Striae robustae, radiales in parte mediana, perpendiculares axe apicali prope extremitates, subtiliter lineatae, 10-11 in 10 μm . Stria centralis ad latus noduli centralis nonnihil visibilis et aliis brevior est.

Description: Valves narrowly lanceolate, acute and produced at the extremities, length 35 μm , breadth 5 μm . Raphe straight slightly apparent. Axial area asymmetrical, very narrowly lanceolate, enlarging some slightly around the central nodule. Striae robust radial around the median part then perpendicular to the apical axis towards the extremities, finely lineate, 10-11 in 10 μm , the central stria situated on one side of the central nodule is slightly visible and more short than its neighbors.

Navicula koniumboensis Manguin ex Kociolek & Reviere

Page 20, pl. 2, fig. 11

Sample: 3

Holotype: AD7654

Descriptio: Valvae ellipticae polis leviter rotundatis, 9 μm longae, 3.5-4 μm latae. Area axialis linearis angusta; area centralis vittiformis transverse dilatata. Striae leniter radiales, 23 in 10 μm , densiores prope extremitates, puncticulosae, punctulis in lineis longitudinalibus regularibus ordinatis.

Description: Valves elliptical with slightly rounded poles, length 9 μm , breadth 3.5-4 μm . Axial area linear, narrow; central area a transversely enlarged band. Striae weakly radial 23 in 10 μm , more condensed near the extremities, finely punctate, the puncta are disposed as regular longitudinal lines.

Navicula stoermeri Kociolek & Reviere
(*N. marginestriata* Manguin nom. nud.)

Page 20, pl. 2, fig. 12

Sample: 16

Holotype: *AD7646

Description: Valvae ovales-elongatae, 10.5 μm longae, 5 μm latae. Raphe in sulco angusto lanceolato satis constricto circum nodulum centralem; rami raphes flexi poros centrales versus. Area axialis insigniter expansa. Striae brevissimae in serie marginali solum circa 1/7 maximae latitudinis valvarum occupanti, 23-24 in 10 μm , parallelae tum radiales prope polos.

Description: Valves oval-elongate, length 10.5 μm , breadth 5 μm , raphe placed within a narrow lanceolate slit noticeably constricted around the central nodule, raphe branches inflected towards the central pores. Axial area quite expanded. Striae very short positioned in one marginal row occupying 1/7 of the breadth of the valve, 23-24 in 10 μm , parallel then radial towards the poles.

Comment: Use of the original epithet of Manguin (*N. marginestriata*) would make this name a later homonym of a species described by Hustedt (1936). This diatom is named in honor Dr. E.F. Stoermer, University of Michigan, Ann Arbor.

Navicula neocaledonica Manguin ex Kociolek & Reviere

Page 20, pl. 2, fig. 13

Sample: 14

Holotype: AD7646

Description: Valvae ellipticae-lanceolatae polis late rotundatis, 14.5 μm longae, 4 μm latae. Raphe recta filiformis. Area axialis linearis; area centralis circularis. Striae omnes radiales, illae circa aream centralem ordinate diminutae, circa 19 in 10 μm , usque ad 35 in 10 μm ad extremitates.

Description: Valves elliptical-lanceolate to the broadly rounded poles, length 14.5 μm , breadth 4 μm . Raphe straight filiform. Axial area linear. Central area circular. Striae entirely radial those disposed around the central area form it by becoming regularly shortened, about 19 in 10 μm to 35 in 10 μm at the extremities.

Comment: Manguin indicated the presence of this species on a slide from sample 16, but listed it from sample 14 only.

Navicula perlucida f. *angustata* Manguin ex Kociolek & Reviere

Page 21, pl. 2, fig. 14

Sample: 9

Holotype: *AD7649

Description: Valvae hyalinae ambitu graciliore quam illo speciei (F. Hustedt, 1925-1937, p. 250, lam. XVII, fig. 43-44), 10 μm longae, 1.5 μm latae. Valvae 7 plo longiores quam latiores (4.5 plo in specie). Area axialis solum notata linea umbrosa aliquantum dilatata in parte centrali. Striae invisibiles.

Description: Valves hyaline with outline more slender than the species, length 10 μm , breadth 1.5 μm , yielding length/breadth = 7, the species = 4.5. Axial area marked only by a shadow line slightly enlarged in the central part, striae invisible.

***Navicula exasperans* Kociolek & Reviere**
(*N. pseudocurta* Manguin nom. nud.)

Page 21, pl. 2, fig. 16

Sample: 18

Holotype: AD7673

Description: *Valvae lineares-ellipticae, extensae-subrostratae ad extremitates, polis rotundatis, 10.5 μm longae, 3.5 μm latae. Raphe recta manifesta solum prope poros centrales. Area axialis lanceolata. Striae radiales, circa 19 in 10 μm in area mediana, 22-23 in 10 μm ad extremitates.*

Description: Valves linear-elliptical, elongate-subrostrate at the extremities, poles rounded, length 10.5 μm , breadth 3.5 μm . Raphe straight, only apparent towards the central pores. Axial area lanceolate. Striae radial, about 19 in 10 μm in the median part, 22-23 in 10 μm at the extremities.

Comments: Use of the original epithet of Manguin (*N. pseudocurta*) would make this name a later homonym of a species described by Cholnoky (1955, p. 20, figs 31, 32), and the new name used here indicates how difficult it was to find a specimen. This holotype slide is from sample 11, while Manguin lists this species from sample 18 only.

***Navicula saxicola* Manguin ex Kociolek & Reviere**

Page 22, pl. 2, fig. 19

Sample: 18

Holotype: *AD7670

Description: *Valvae structura subtilissima, lineares et longe extensae-subrostratae ad extremitates, polis rotundatis-obtusis, 14-20 μm longae, 3.5 μm latae. Raphe recta manifesta solum prope centrum valvae. Area axialis linearis-lanceolata, ad extremitates indistincta et raphe confusa. Striae haud distinctae.*

Description: Valves with a very delicate structure, linear and longly subrostrate at the extremities, rounded-obtuse poles, length 14-20 μm , breadth 3.5 μm . Raphe straight only apparent towards the center of the valve. Axial area linear lanceolate, becoming indistinct at the extremities where they merge with the raphe. Striae indiscernable.

***Navicula verecundaeformis* Manguin ex Kociolek & Reviere**

Page 22, pl. 2, fig. 21a, b

Sample: 3

Holotype: AD7655

Description: *Valvae anguste lineares-lanceolatae, nonnihil extensae ad extremitates, polis late rotundatis, 7-12 μm longae, 2.5-4 μm latae. Area axialis anguste lanceolata; area centralis transverse et irregulariter dilatata, absens in speciminibus parvis. Striae radiales circa 23 in 10 μm , densiores ad extremitates.*

Description: Valves narrowly linear-lanceolate, slightly elongate at the extremities and broadly rounded at the poles, length 7-12 μm , breadth 2.5-4 μm . Axial area narrowly lanceolate. Central area transversely and irregularly enlarged, non-existent in small individuals. Striae radial, about 23 in 10 μm , the terminal striae are more condensed.

***Pinnularia divergens* Wm. Smith var. *malayensis* Hustedt f. *linearis* Manguin ex Kociolek & Reviere**

Page 23, pl. 3, fig. 4

Samples: 11, 18

Holotype: AD7671

Descriptio: Valvae lineares aliquantum tumidae in parte mediana, ad extremitates late rotundatae et non subcapitatae, 112-123 μm longae, 18 μm latae; costae circa 8-10 in 10 μm .

Description: Valves linear, slightly tumid around the median part, broadly rounded and not subcapitate at the extremities, length 112-123 μm , breadth 18 μm . About 8-10 ribs in 10 μm .

Comment: Manguin also lists this taxon on slide AD7670 from this same sample.

***Pinnularia gibba* Ehrenberg var. *cuneata* Manguin ex Kociolek & Reviere**

Page 23, pl. 4, fig. 4

Sample: 11

Holotype: AD7672

Descriptio: Valvae lanceolatae, abrupte constrictae et rotundatae-cuneiformes ad extremitates, 58 μm longae, 9 μm latae; striae 10-11 in 10 μm .

Description: Valves lanceolate, abruptly constricted and rounded-cuneiform at the extremities, length 58 μm , breadth 9 μm . 10-11 striae in 10 μm .

***Pinnularia intermedia* (Lagerstedt) Cleve var. *bryophila* Manguin ex Kociolek & Reviere**

Page 23, pl. 3, fig. 6

Sample: 10

Holotype: AD7634

Descriptio: Valvae lineares lateribus parallelis in parte mediana, plus minusve longe attenuatae ad extremitates, polis late rotundatis, 20-23 μm longae, 3-4 μm latae. Area centralis elevatissima. Striae radiales, 8-10 in 10 μm , ad extremitates convergentes.

Description: Valves linear with parallel sides in the median part, + elongate attenuate at the extremities with poles broadly rounded, length 20-23 μm , breadth 3-4 μm . Central area very expanded in height, radial striae becoming convergent towards the extremities, 8-10 in 10 μm .

***Pinnularia odiosa* Manguin ex Kociolek & Reviere**

Page 24, pl. 3, fig. 7

Sample: 10

Holotype: AD 7632

Descriptio: Valvae angustae lateribus parallelis in parte mediana, leviter attenuatae extremitates versus, polis late rotundatis, 32-34 μm longae, 4.5-5.5 μm latae. Raphe recta, curva prope poros centrales. Area axialis late lanceolata; area centralis vittiformis aliquantum elevata. Striae omnes radiales, 16-20 in 10 μm .

Description: Valves narrow with parallel sides in the median part, gradually attenuate towards the extremities with broadly rounded poles, length 32-34 μm , breadth 4.5-5.5 μm . Raphe straight, incurved near the central pores. Axial area broadly lanceolate, central area made of a transverse band, clearly elevated. Striae entirely radial 16-20 in 10 μm .

***Pinnularia subcapitata* Gregory var. *stauroneiformis* Van Heurck f. *subcuneata* Manguin ex Kociolek & Reviere**

Page 24, pl. 4, fig. 3

Sample: 16

Holotype: AD7646

Descriptio: Valvae lineares-lanceolatae, attenuatae rostrataeque ad extremitates, polis rotundatis, 21 μm longae, 4.5 μm latae. Area centralis satis elevata. Striae 12 in 10 μm .

Description: Valves linear-lanceolate, narrowing and rostrate at the extremities, poles rounded, length 21 μm , breadth 4.5 μm . Central area noticeably expanded in the direction of height, 12 striae in 10 μm .

***Caloneis aequatorialis* Hustedt var. *transitoria* Manguin ex Kociolek & Reviere**

Page 25, pl. 4, fig. 6a, b

Samples: 5, 7

Holotype: AD7639

Descriptio: Longitudo valvarum 26-28 μm , latitudo 6-15 μm ; striae 16-18 in 10 μm , leniter radiales, convergentes ad extremitates.

Description: Length 26-28 μm , breadth 6-15 μm ; 16-18 striae in 10 μm , weakly radial, convergent at the extremities.

***Caloneis bryophila* Manguin ex Kociolek & Reviere**

Page 25, pl. 4, fig. 7

Sample: 10

Holotype: AD7632

Descriptio: Valvae lineares-lanceolatae polis rotundatis-obtusis, 32.5 μm longae, 5.5 μm latae. Raphe recta simplex ramis leniter curvis prope poros centrales. Area axialis lanceolata circa dimidium latitudinis valvae occupans; area centralis vittiformis transver-

saliter extensa, latera valvae attingens. Striae medianae convergentes, radiales extremitates versus, circa 13 in 10 μ m, linea longitudinali hyalina sectae.

Description: Valves linear-lanceolate, rounded-obtuse at the poles, length 32.5 μ m, breadth 5.5 μ m. Raphe straight, simple and branches weakly incurved towards the central pores. Axial area lanceolate occupying to slightly near half the valve breadth. Central area transversely expanded to the valve margin in a subquadrate band. Median striae convergent becoming radial towards the extremities, about 13 in 10 μ m, crossed by a hyaline longitudinal line.

***Caloneis clevei* Lagerstedt var. *intermedia* Manguin ex Kociolek & Reviere**

Page 25, pl. 4, fig. 8

Samples: 1, 7, 11

Holotype: AD7668

Description: Valvae lineares-lanceolatae, constrictae-capitatae ad extremitates, polis rotundatis-obtusis, 28-31 μ m longae, 5.5-6 μ m latae. Area axialis late lanceolata; area centralis quadrata insigniter alta. Striae radiales manifeste convergentes ad extremitates, circa 24-26 in 10 μ m.

Description: Valves linear-lanceolate, constricted capitate at the extremities with rounded-obtuse poles, length 28-31, breadth 5.5-6 μ m. Axial area broadly lanceolate. Central area noticeably high, quadrate. Radial striae clearly convergent at the extremities, about 24-26 in 10 μ m.

***Caloneis neocaledonica* Manguin ex Kociolek & Reviere**

Page 26, pl. 4, fig. 9a, b

Sample: 4

Holotype: AD7661

Description: Valvae lineares manifeste constrictae in parte mediana, manifeste dilatatae extremitates versus, polis rotundatis-cuneiformibus, 97-100 μ m longae, 17-18 μ m latae. Raphe recta ramis aliquantum curvis prope poros centrales. Area axialis lanceolata; area centralis vittiformis rectangularis usque ad latera valvae extensa. Striae omnes radiales, 12-13 in 10 μ m, linea hyalina longitudinali sectae.

Description: Valves linear, clearly constricted in the median part, then noticeably enlarged towards the extremities, poles rounded-cuneiform, length 97-100 μ m, breadth 17-18 μ m. Raphe straight, with branches somewhat slightly inflected towards the central pores. Axial area lanceolate, central area expanded to the valve margin in a rectangular band. Striae entirely radial, 12-13 in 10 μ m, crossed by a hyaline longitudinal line.

***Amphora imperfecta* Manguin ex Kociolek & Reviere**

Page 26, pl. 4, fig. 10

Sample: 2

Holotype: AD7666

Description: Aspectus valvaris: valva latere dorsali valde convexo, latere ventrali leniter convexo, abrupte constricta et capitata ad extremitates. Poli late rotundati et flexi latus

ventrale versus. Longitudo valvae 24.5 µm, latitudo 5 µm. Raphe ramis oblique spectantibus latus dorsale versus et deflexis ad poros centrales. Area axialis parvula in latere dorsali, in latere ventrali expansa fere usque ad marginem. Area centralis effecta in latere dorsali. Striae dorsales circa 18 in 10 µm, lineis 3-4 longitudinalibus hyalinis sectae; striae punctulosae circum aream centalem; striae ventrales parvulae, circa 25-26 in 10 µm.

Description: The few rare examples of this new *Amphora* have only been observed, after assembly in Pleurax, in valve view; it is strongly arched on the dorsal margin and weakly convex on the ventral margin, abruptly constricted and capitate at the extremities, the poles are broadly rounded and obliquely incurved on the ventral side, length 24.5 µm, breadth 5 µm. Raphe branches run obliquely towards the dorsal side and bend towards the central pores. Axial area very reduced on the dorsal border, expanded almost to the margin of the ventral side, central area developed on the dorsal side. Dorsal striae about 18 in 10 µm, crossed by 3-4 hyaline longitudinal lines, striae surrounding the central area are finely punctate; ventral striae very reduced, about 25-26 in 10 µm.

***Cymbella angustata* (Wm. Smith) Cleve f. *integra* Manguin ex Kociolek & Reviere**

Page 26, pl. 4, fig. 11

Samples: 3, 5, 6, 7, 16, 18

Holotype: *AD7670

Description: Valvae naviculares ad lineam medianam leniter asymmetricae, lanceolatae, minime attenuatae et non rostratae-capitatae ad extremitates similiter atque speciem, 30-51 µm longae, 6-8 µm latae. Striae radiales, circa 16 in 10 µm, densiores ad extremitates, 23 in 10 µm.

Description: Valve naviculiform, weakly asymmetrical to the median line, lanceolate, hardly narrowed and non rostrate-capitate at the extremities like the species, length 39-51 µm, breadth 6-8 µm, radial striae, about 16 in 10 µm, more condensed at the extremities, 23 in 10 µm.

***Cymbella delicatula* Kützing f. *lata* Manguin ex Kociolek & Reviere**

Page 27, pl. 5, fig. 3

Sample: 7

Holotype: AD7668

Description: Valvae asymmetricae, lanceolatae et minime extensae ad extremitates, 30 µm longae, 6 µm latae. Striae radiales, medianae dorsales 17 in 10 µm, ventrales 20 in 10 µm, usque ad 28 et plus in 10 µm extremitates versus.

Description: Valves asymmetrical, lanceolate and very slightly constricted at the extremities, length 30 µm, breadth 6 µm, striae radial, the median striae on the dorsal side 17 in 10 µm, on the ventral side 20 in 10 µm, reaching 28 and more in 10 µm at the extremities.

***Cymbella delicatula* Kützing f. *obtus*a Manguin ex Kociolek & Reviere**

Page 27, pl. 5, fig. 4

Samples: 2, 6, 8, 12, 16

Holotype: *AD7641

Descriptio: Valvae minus asymmetricae quam illae speciei, lanceolatae, polis latius rotundatis-obtusis, 35 μm longae, 6.5 μm latae; striae radiales, medianae dorsales 15 in 10 μm , ventrales 17 in 10 μm , terminales 23-25 in 10 μm .

Description: Valves less asymmetrical than the species, lanceolate with very broadly rounded-obtuse poles, length 35 μm , breadth 6.5 μm . striae radial, the median dorsal striae 15 in 10 μm and the ventral striae 17 in 10 μm . Terminal striae 23-25 in 10 μm .

Comment: This type is from sample 17.

***Cymbella hugonii* Manguin ex Kociolek & Reviere**

Page 27, pl. 4, fig. 13

Sample: 13

Holotype: AD7663

Descriptio: Valvae naviculares symmetricae, lanceolatae et anguste extensae ad extremitates, 22 μm longae, 4 μm latae. Raphe recta. Area axialis anguste lanceolata area centrali non manifesta. Striae omnes radiales, in utroque latere valvae numero aequales, circa 20-23 in 10 μm .

Description: Valves with naviculoid symmetry, lanceolate and narrowly elongated at the extremities, length 22 μm , breadth 4 μm . Raphe straight. Axial area narrowly lanceolate without the appearance of a central area. Striae entirely radial and the same number on the two sides of the valve, about 20-23 in 10 μm .

***Cymbella neocaledonica* Manguin ex Kociolek & Reviere**

Page 28, pl. 5, fig. 6a, b

Sample: 17

Holotype: *AD7647

Descriptio: Valvae asymmetricae, lineares-lanceolatae, aliquantum extensae et interdum subrostratae ad extremitates, 24-34 μm longae, 5-5.5 μm latae. Raphe recta, leviter curva prope poros centrales. Area axialis anguste lanceolata, aliquantum dilatata in latere dorsali noduli centralis. Striae radiales 13-14 in 10 μm , subtiliter lineatae, terminales densiores et convergentes.

Description: Valves asymmetrical, linear-lanceolate, noticeably elongated and sometimes subrostrate at the extremities, length 24-34 μm , breadth 5-5.5 μm . Raphe straight, lightly curved towards the central pores. Axial area narrowly lanceolate, somewhat enlarged on the dorsal border of the central nodule. Radial striae 13-14 in 10 μm , finely lineate, the terminal striae more condensed and convergent.

***Cymbella subturgida* Hustedt in Schmidt et al. var. *neocaledonica* Manguin ex Kociolek & Reviere**

Page 28, pl. 5, fig. 7a, b

Samples: 14, 18

Holotype: AD7669

Descriptio: *Valvae asymmetricae lanceolatae, lateribus convexis quorum altero ventrali minus convexo et interdum aliquantum tumido in medio, extremitatibus rotundatis-acutis, 36-49 µm longae, 8-9.5 µm latae. Striae valde radiales, in utroque latere numero aequales, circa 10 in 10 µm, 13 in 10 µm extremitates versus, manifeste lineatae. Praeterea characteres omnes alii varietatis nostrae eadem ac varietas wallaceana Hust. (1942, p. 105, fig. 222 ad 224) sunt, praeter raphe concomitantam linea manifesta quae in figuris originalibus auctoris non picta est.*

Description: Asymmetrical lanceolate valves, convex at the margins, the ventral margin to a lesser degree and sometimes slightly tumid about the middle, valve extremities rounded-acute, length 36-49 µm, breadth 8-9.5 µm. Striae strongly radial, the same number on both sides, about 10 in 10 µm, at the extremities 13 in 10 µm, distinctly lineate. Furthermore, all the other characters of this variety are identical to var. *wallaceana* Hust. An exception being the raphe, which is provided with a quite apparent accompanying line, this line is not figured in the original figures of the author.

***Cymbella tenuissima* Hustedt var. *semiradiata* Manguin ex Kociolek & Reviere**

Page 29, pl. 4, fig. 14

Samples: 17, 18

Holotype: AD7669

Descriptio: *A specie (F. Hustedt, 1942, p. 100, fig. 210-203) striis dorsalibus manifeste radialibus differt. Longitudo valvarum 20.5 µm, latitudo 3.5-4 µm. Striae circa 32-34 in 10 µm, paulum dissitiores in medio lateris dorsalis, omnes raphe perpendiculares in latere ventrali.*

Description: Differs from the species by its clearly radial dorsal striae, length of the valves 20.5 µm, breadth 3.5-4 µm, about 32-34 striae in 10 µm, slightly more spaced on the median dorsal side, on the ventral side striae are entirely perpendicular to the raphe.

***Gomphonema bourrellyi* Manguin ex Kociolek & Reviere**

Page 29, pl. 5, fig. 9

Samples: 13, 14, 16, 18

Holotype: AD7663

Descriptio: *Valvae lineares-lanceolatae, polo capitali quam pedali latiore, pariete polari satis manifesto, 43.5-70 µm longae, 6-7 µm latae. Raphe recta linea paulo manifesta concomitata. Area axialis lanceolata; area centralis circularis sine stigmatibus. Striae radiales punctis sublinearibus ad subpunctiformibus, 9-11 in 10 µm. Rima polaris capitalis in area terminali hyalina locata.*

Description: Valves linear-lanceolate with the headpole broader than the footpole, polar partition fairly apparent, length 43.5-70 µm, breadth 6-7 µm. Raphe straight with

an accompanying line slightly apparent. Axial area lanceolate, central area circular without an isolated point. Striae radial in subpunctiform dashes, 9-11 in 10 μm . Slit at the headpole situated in a terminal hyaline area.

Comment: Moser *et al.* (1995) described a new diatom, *Gomphonema neobourrellyi* Moser & Lange-Bertalot, and listed *G. bourrellyi* as a synonym with a "?".

Gomphonema neocaledonica Manguin *ex* Kociolek & Reviere

Page 30, pl. 5, fig. 10a, b

Samples: 3, 12, 16, 17

Holotype: AD7646

Description: *Valvae longe lineares-lanceolatae, polo capitali quam pedali latius rotundato-obtusae, 40-75 μm longae, 5.5-7.5 μm latae. Raphe recta linea manifestissima concomitata. Poris centralibus latus versus curvis. Area axialis lanceolata; area centralis elliptica paulo plus quam dimidium longitudinis medianae valvae occupans, sine stigmatibus. Striae radiales, 9-11 in 10 μm , manifeste punctatae, punctis circa 20-25 in 10 μm . Striae terminales poli capitalis rimam polarem anguste cingentes.*

Description: Valves elongate linear-lanceolate, headpole more broadly rounded-obtuse than the footpole, length 40-70 μm , breadth 5.5-7.5 μm . Raphe straight with an accompanying line quite apparent, central pores laterally recurved. Axial area lanceolate, central area elliptical occupying slightly more of the middle of the median breadth of the valve, without an isolated point. Striae radial 9-11 in 10 μm , clearly punctate, about 20-25 puncta in 10 μm . Terminal striae at the headpole narrowly surrounding the polar slit.

Comment: Moser *et al.* (1995) described a new diatom, *Gomphonema neobourrellyi* Moser & Lange-Bertalot, and listed *G. neocaledonica* as a synonym with a "?".

Gomphonema opimum Kociolek & Reviere

(*G. simplex* Manguin *nom. nud.*)

Page 30, pl. 3, fig. 9

Sample: 8

Holotype: *AD7641

Description: *Valvae ellipticae-lanceolatae, extensae et plus minusve rostratae ad subcapitatae ad extremitates, 12-13 μm longae, 3.5-4 μm latae. Area axialis angusta non dilatata circum nodulum centralem, sine stigmatibus. Striae radiales, circa 23 in 10 μm .*

Description: Valves elliptical lanceolate, elongate and + rostrate to subcapitate at the extremities, length 12-13 μm , breadth 3.5-4 μm . Axial area narrowly not enlarged around the central nodule, without an isolated point. Striae radial, about 23 in 10 μm .

Comments: Use of the original epithet of Manguin (*G. simplex*) would make this name a later homonym of a species described by Kützing (1833, p. 565, pl. 16, fig. 52). Although Van Landingham (1971) offered a new name, *G. simplex* Van Landingham, for Manguin's species, neither name has nomenclatural status, since the species did not have a valid description and type designation. The epithet *opimum* refers to the great abundance of this species in the sample from which it is described.

***Epithemia argus* (Ehrenberg) Kützing var. *lunaeformis* Manguin ex Kociolek & Reviere**

Page 30, pl. 6, fig. 1a, b

Sample: 18

Holotype: AD7670

Descriptio: *Valvae lunares, latere dorsali valde convexo, latere ventrali leniter concavo, 78-80 µm longae, 14-15 µm latae. Canalis raphes manifestus solum in parte mediana valvae, ramis latus ventrale versus leniter curvis, angulum latissimum formantibus, attingentem paulo plus quam dimidium latitudinis axis transapicalis. Series areolarum 7-9 in 10 µm; parietes interni robustissimi, 1-2 in 10 µm.*

Description: Valves in the form of a lunar crescent, strongly curved along the dorsal side, weakly concave along the ventral side, length 78-80 µm, breadth 14-15 µm. Raphe canal clearly apparent in the median part of the valve, with branches weakly curved in the direction of the ventral margin, forming an angle very open reaching slightly more than half of the breadth of the transapical axis. 7-9 rows of areolae in 10 µm; internal partitions very robust 1-2 in 10 µm.

***Nitzschia hiengheneana* Manguin ex Kociolek & Reviere**

Page 32, pl. 6, fig. 5

Sample: 11

Holotype: AD7672

Descriptio: *Valvae lineares-lanceolatae, latere ventrali leniter concavo, attenuatissimae productaeque prope polos rotundatos-acuteos, 18-19 µm longae, 3-3.5 µm latae. Puncta carinalia robusta, duo mediana quam alia distantiora, 10-12 in 10 µm. Striae lineis longitudinalibus hyalinis sectae; striae transapicales circa 19-25 in 10 µm.*

Description: Valves linear-lanceolate with ventral margin lightly concave, very small and produced near the rounded-acute poles, length 18-19 µm, breadth 3-3.5 µm. Keel puncta robust, the two median ones more distant than the neighboring ones, 10-12 in 10 µm, striae crossed by hyaline longitudinal lines, about 19-25 transapical striae in 10 µm.

***Nitzschia luzonensis* Hustedt f. *brevior* Manguin ex Kociolek & Reviere**

Page 32, pl. 6, fig. 6

Sample: 1

Holotype: *AD7648

Descriptio: *Valvae lanceolatae ad extremitates acuteae, 14-15 µm longae, 2-2.5 µm latae. Puncta carinalia 9-10 in 10 µm. Striae 26-30 in 10 µm.*

Description: Valves lanceolate, acute at the extremities, length 14-15 µm, breadth 2-2.5 µm, 9-10 keel puncta in 10 µm, striae 26-30 in 10 µm.

***Nitzschia neocaledonica* Manguin ex Kociolek & Reiers**

Page 32, pl. 6, fig. 7a, b

Sample: 11

Holotype: *AD7672

Description: Valvae ellipticae-lanceolatae ad lineares-lanceolatae, manifeste constrictae-capitatae ad extremitates, 13-30 μm longae, 3-4 μm latae; puncta carinalia 10-13 in 10 μm ; striae invisibiles.

Description: Valves elliptical-lanceolate to linear-lanceolate, clearly constricted-capitate at the extremities, length 13-30 μm , breadth 3-4 μm , 10-13 keel puncta in 10 μm , striae invisible.

***Nitzschia subbacata* Manguin ex Kociolek & Reiers**

Page 32, pl. 7, fig. 4

Sample: 11

Holotype: *AD7673

Description: Valvae angustae longe lineares-lanceolatae, extremitatibus modice acutis, polis non capitatis, 108-110 μm longae, 3.5-4 μm latae. Puncta carinalia minutissima 10-12 in 10 μm , punctis duobus medianis quam aliis non distantioribus. Striae invisibiles.

Description: Valves narrow elongated linear-lanceolate, extremities fairly acute with non-capitate poles, length 108-110 μm , breadth 3.5-4 μm . Keel puncta very shortened, 10-12 in 10 μm , the 2 median keel puncta are noticeably displaced and larger. Striae invisible.

***Nitzschia vitruca* Norman var. *tenuistriata* Manguin ex Kociolek & Reiers**

Page 33, pl. 6, fig. 8a, b

Sample: 10

Holotype: AD7633

Description: Valvae striis quam illis speciei densioribus minimum 30-35 in 10 μm , punctis carinalibus circa 5 in 10 μm , extremitatibus valde capitatis.

Description: Valves with striae more constricted than the species, 30-35 in 10 μm , keel puncta about 5 in 10 μm , valve extremities strongly capitate.

***Surirella neocaledonica* Manguin ex Kociolek & Reiers**

Page 33, pl. 7, fig. 6a, b

Samples: 6, 7

Holotype: AD7668

Description: Frustulum axe apicali isopolari. Valvae ellipticae ad lineares-ellipticae, polis late rotundatis, 49-90 μm longae, 16-22 μm latae. Area mediana anguste lanceolata sine pseudoraphe visibili. Alae angustae paulo manifestae, interdum indistinctae, sine prominentia alari visibili. Canales angusti, 30-40 in 10 μm . Superficies valvaris leniter undulata, partibus depressis et elevatis undularum latitudine inaequalibus. Membrana cellularis manifeste striata, striis circa 25-30 in 10 μm .

Description: Frustule with apical axis isopolar. Valves elliptical to linear-elliptical, with poles broadly rounded, length 49-90 μm , breadth 16-22 μm ; median zone narrowly lanceolate without the appearance of a pseudoraphe. Wings narrow and slightly apparent, sometimes indistinct, with alar projections visible. Canals narrow, 30-40 in 100 μm . Valve surface weakly undulate, depression and summit of the undulations of unequal breadth. Cell membrane distinctly striated, striae about 25-30 in 10 μm .

Comment: Moser *et al.* (1995) designated a neotype (PC, Collection Maillard No. 16/1, Riviere Ouenkoh) for this taxon, but did not provide a validating description.

Surirella pseudomargaritifera Manguin *ex* Kociolek & Reviere

Page 33, pl. 7, fig. 7

Sample: 4

Holotype: AD7662

Descriptio: Frustulum axe apicali isopolari. Valvae ovaes polis late rotundatis, 30 μm longae, 13 μm latae. Prominentiae alares indistinctae. Canales circa 40 in 100 μm . Ondulae (costae) a lateribus valvae usque ad aream centralem extensae, partibus depressis et elevatis undularum latitudine plus minusve aequalibus. Sine pseudoraphe visibili. Membrana cellularis manifeste striata in partibus elevatis undularum, striis circa 30 in 10 μm . Praeterea, membrana spinis parvis omnino instructa.

Description: Frustule with apical axis isopolar. Valves oval with broadly rounded poles, length 30 μm , breadth 13 μm . Alar projections indistinct, canals about 40 in 100 μm . Undulations (ribs) stretch from the valve margin to as far as the central zone, depression and summit of the undulations slightly close to equal breadth. The pseudoraphe is not apparent. Cell membrane visibly striated to the summit of the undulations, about 30 striae in 10 μm . On the outside the membrane is garnished entirely with small spines.

Surirella spinifera Hustedt var. *armata* Manguin *ex* Kociolek & Reviere

Page 34, pl. 7, fig. 8

Samples: 3, 4, 6, 7, 8

Holotype: AD7654

Descriptio: Frustulum axe apicali heteropolari. Valvae oviformes-elongatae, polis cuneiformibus-rotundatis, latitudine paulo longiore quam triente axis apicalis, 103-184 μm longae, 39-57 μm latae. Area mediana lanceolata pseudoraphe manifestissima instar cristae munitae spina longa robustaque ad extremitatem utramque. Prominentiae alares absunt, itaque canales fenestraeque in lateribus valvae non visibiles sunt. Superficies valvae a lateribus usque ad aream centralem undulata, undulis circa 15-20 in 100 μm , in medio perpendicularibus linea mediana, polos versus radialibus. Membrana cellularis subtilissime striata, spinis parvis manifestis instructa in depressionibus undularum.

Description: Frustule with apical axis heteropolar. Valves ovoid-elongate, with poles cuneiform-rounded, the valve reaching in the greatest breadth slightly more than a third of the length of the apical axis, length 103-184 μm , breadth 39-57 μm . Median zone lanceolate with the pseudoraphe quite apparent in that the crest is armed at the two extremities with a long and robust spine. Alar projections absent, a consequence of canals and fenestrae not appearing on the border of the valve. Surface of the valve

undulation from the margin to the median zone, about 15-20 undulations in 10 µm, perpendicular to the median line in the middle, radial towards the poles. Cell membrane finely striated, covered by small spines easily visible in the depressions of the undulations.

Comment: Moser *et al.* (1995) designated ■ neotype (PC, Collection Maillard No. A5, Source, Ile des Pins) for this taxon, but did not provide a validating description.

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